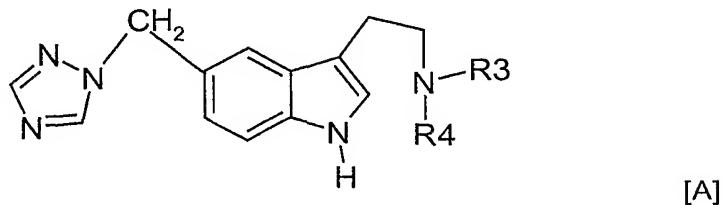


Claims:

1. A process for the manufacture of an 1,2,4-triazol-1-yl compound of the formula [A],



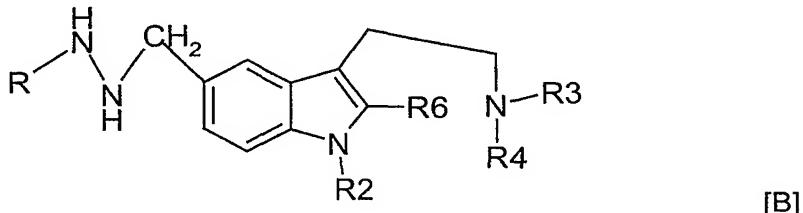
or a salt thereof,

wherein

each of R3 and R4 is hydrogen or lower alkyl

said process comprising

reacting a hydrazine compound of the formula [B]



wherein

R is hydrogen or acyl

R2 is hydrogen or a protecting group, each of R3 and R4 is hydrogen or lower alkyl, and

R6 is hydrogen or a group COOR7, with R7 being hydrogen or one equivalent of a cation or a suitable hydrocarbon residue,

or a salt thereof,

with a 1,2,4-triazolyl forming reagent,

and, if R is acyl in formula [B], optionally removing an acyl group R before the reaction of the compound of the formula [B] with the 1,2,4-triazolyl forming reagent, and removing any protecting group R2 and removing any group COOR7 to produce the compound of the formula [A], or a salt thereof.

2. The process according to claim 1 wherein R6 is hydrogen.

3. The process according to claim 1 or 2 for the manufacture of Rizatriptan.

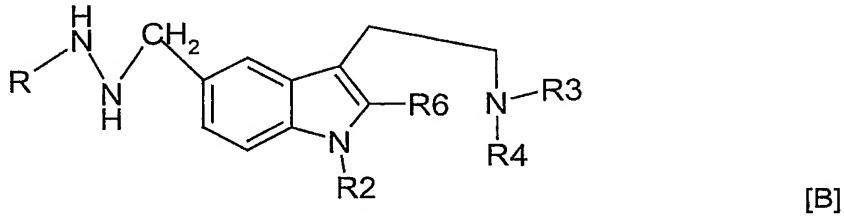
4. The process according to any of claims 1 to 3, comprising the additional step of converting a salt of a resulting compound of the formula [A] into a free form of a compound of the formula [A], converting a resulting free form of a compound of the formula [A] into a salt, or converting a salt of a compound of the formula [A] into a different salt.

5. The process according to any of claims 1 to 4, where R in the compound of formula [B] is hydrogen, formyl or C₂-C₇alkanoyl, and C₂-C₇alkanoyl, if present, is hydrolytically removed prior to the reaction with the 1,2,4-triazolyl forming reagent, and where in each of formulae [A] and [B] each of R3 and R4 is methyl and the compound of the formula [A] is produced in free form or in the form of a pharmaceutically acceptable salt.

6. The process according to any of claims 1 to 5, where the 1,2,4-triazolyl forming reagent is selected from the group consisting of 1,3,5-triazine, formamidine, formamidinium salts or derivatives and formamide.

7. Process according to any of claims 1 to 6, wherein, prior to the reaction with the 1,2,4-triazolyl forming reagent, the compound of the formula [B] as defined in claim 1 is converted into the mono- or diammonium salt by reaction with 1 or 2 equivalents of a protic acid, and purified by crystallization or recrystallization.

8. A process for the manufacture of a compound of the formula [B] or a salt thereof,



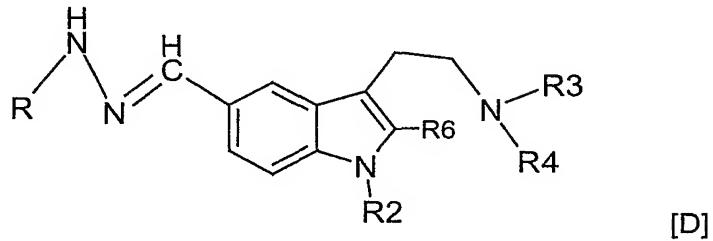
wherein

R is hydrogen or acyl

R2 is hydrogen or a protecting group,

each of R3 and R4 is hydrogen or lower alkyl,

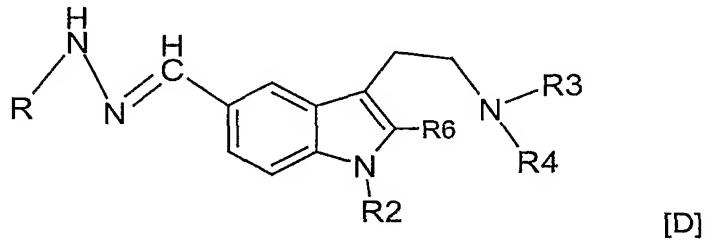
R6 is hydrogen or a group COOR7, with R7 being hydrogen or one equivalent of a cation or a suitable hydrocarbon residue,
 comprising reacting a compound of the formula [D],



wherein R, R2, R3, R4 and R6 are as defined above, or a salt thereof, under reductive conditions to a compound of the formula [B], or a salt thereof, and if residue R6 is COOR7, optionally converting residue R6 into hydrogen.

9. Process of claim 8, wherein R is hydrogen or lower alkanoyl, and each of R3 and R4 is methyl.

10. A process for the manufacture of a compound of the formula [D]



or a salt thereof, wherein

R is hydrogen or acyl,

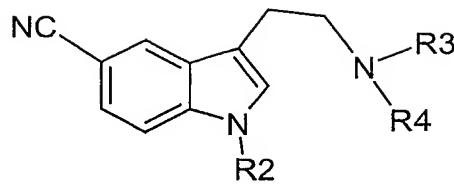
R2 is hydrogen or a protecting group,

each of residues R3 and R4 is hydrogen or lower alkyl and

R6 is hydrogen,

comprising reacting a compound of the formula [E],

55



[E]

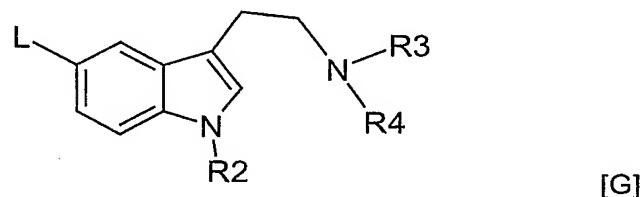
wherein each of R2, R3 and R4 is as defined above, or a salt thereof, with a hydrazine of the formula [F],



wherein R is as defined above, or a salt thereof, under reductive conditions to the compound of the formula [D], or a salt thereof.

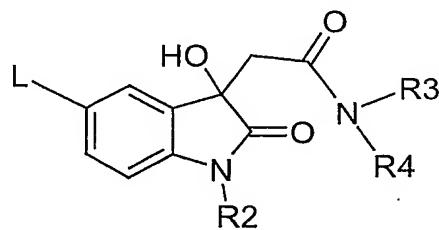
11. Process of claim 10, wherein R is hydrogen or lower alkanoyl, and each of R3 and R4 is methyl.

12. Process of claim 10 or 11, wherein the compound of the formula [E] is obtained by reacting a compound of the formula [G],



wherein R2, R3 and R4 are as defined in claim 10 or 11, or a salt thereof, and L is halogen or unsubstituted or substituted alkanesulfonyloxy or arylsulfonyloxy, with a cyanide salt, optional in the presence of a catalyst.

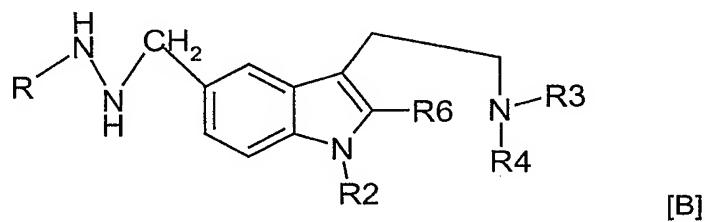
13. A process of claim 12, wherein the compound of the formula [G], or salt thereof, is obtained by reducing a compound of the formula [H],



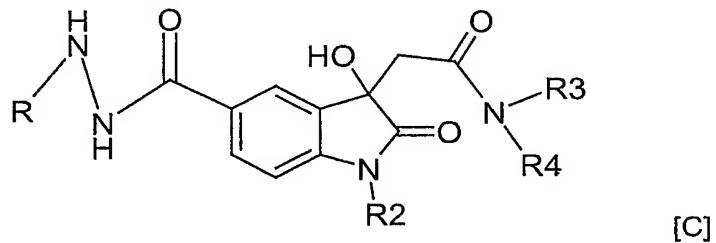
[H]

wherein R₂, R₃, R₄ and L are as defined in claim 12, in the presence of borane, and subjecting the resulting product(s) to removal of borane from any amino borane intermediates to a subsequent oxidation/de-hydrogenation with an oxidant, in order to yield the compound of the formula [G], or a salt thereof.

14. A process for the manufacture of a compound of the formula [B]

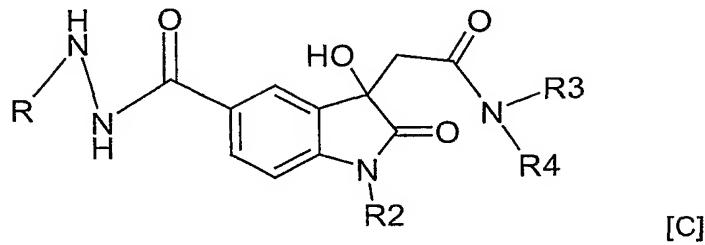


wherein R is hydrogen or acyl, R₂ is hydrogen or a protecting group, and each of R₃ and R₄ is hydrogen or lower alkyl, and R₆ is hydrogen or COOR₇, R₇ is hydrogen or one equivalent of a cation or a suitable hydrocarbon residue or a salt thereof, comprising reducing a compound of the formula [C],

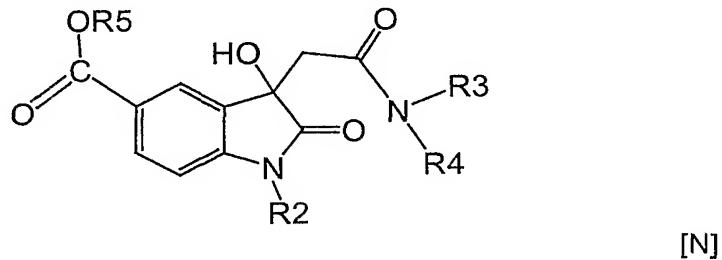


wherein R, R₂, R₃ and R₄ are as defined above, or a salt thereof, in the presence of borane, and subjecting the resulting product(s) to removal of borane from any amino borane intermediates and to a subsequent oxidation/de-hydrogenation with an oxidant, thus producing a compound of the formula [B], or a salt thereof.

15. A process for the manufacture of a compound of the formula [C]



or a salt thereof, wherein R is hydrogen or acyl, R2 is hydrogen or a protecting group, and each of R3 and R4 is hydrogen or lower alkyl, or a salt thereof, comprising reacting a compound of the formula [N],



wherein R2, R3 and R4 are as defined above and R5 is unsubstituted or substituted alkyl or a salt thereof, with a hydrazine of the formula [F]

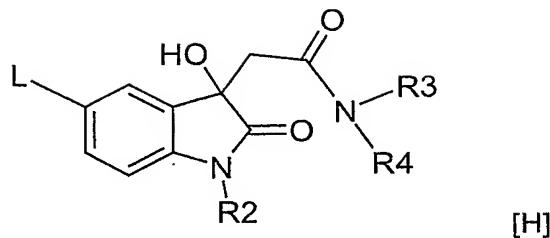


wherein R is as defined above, or a salt thereof,

to a compound of the formula [C] or a salt thereof.

16. Process of claim 15, wherein R5 in formula [N] is lower alkyl, and/or R in formula [F] is hydrogen.

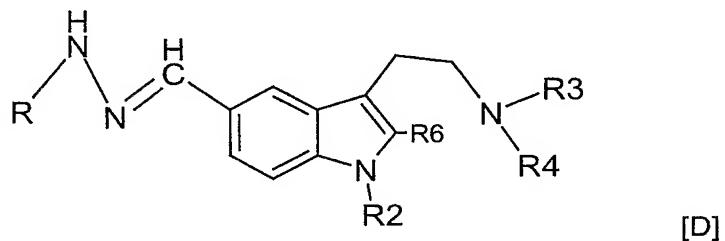
17. Process of claim 15 or 16, wherein the compound of the formula [N] is obtained by reacting a compound of the formula [H]



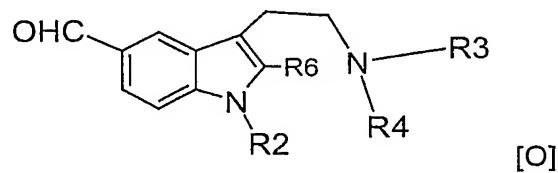
or a salt thereof, wherein R2, R3 and R4 are as defined in claim 15 or 16, and L is halogen, unsubstituted or substituted alkanesulfonyloxy or arylsulfonyloxy,

with carbon monoxide in the presence of the corresponding alcohol R5-OH, wherein R5 is as defined in claim 15 or 16, a catalyst and a tertiary nitrogen base, to the compound of the formula [N].

18. A process for the manufacture of a compound of the formula [D]



or a salt thereof, wherein R2 is hydrogen or a protecting group, each of R3 and R4 is hydrogen or lower alkyl, R6 is hydrogen or COOR7, R7 is hydrogen or one equivalent of a cation or a suitable hydrocarbon residue and R is hydrogen or acyl, comprising reacting an aldehyde of the formula [O],

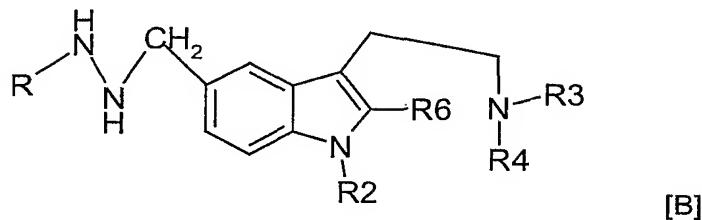


or a salt thereof, with a compound of the formula [F]

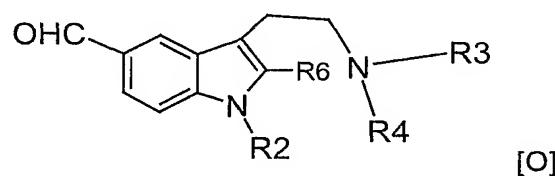


wherein R, R2, R3, R4, R6 and R7 are as defined above, and if R6 is COOR7, optionally converting R6 into hydrogen.

19. A process for the manufacture of a compound of the formula [B]



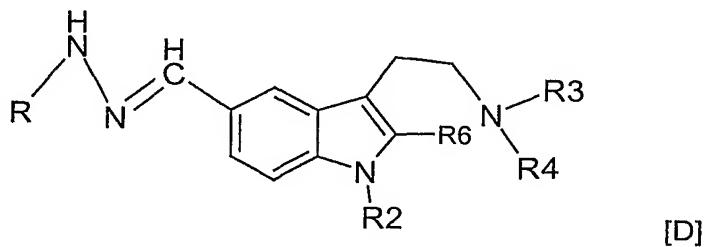
or a salt thereof, wherein R is hydrogen or acyl, R2 is hydrogen or a protecting group, each of R3 and R4 is hydrogen or lower alkyl, R6 is hydrogen or COOR7, and R7 is hydrogen or one equivalent of a cation or a suitable hydrocarbon residue, comprising reacting an aldehyde of the formula [O]



or a salt thereof, with a hydrazine [F]



to a hydrazone of the formula [D]



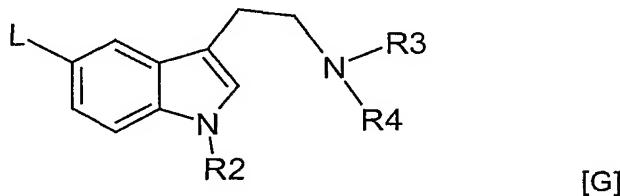
or salt thereof,

followed by subsequent reduction of the hydrazone of the formula [D] or salt thereof, to a compound of the formula [B], or a salt thereof, and if R6 is COOR7 optionally converting R6 into hydrogen.

20. Process according to claim 19, wherein R is hydrogen, formyl or C₂-C₇alkanoyl, R₂ is a protecting group or hydrogen, and each of R₃ and R₄ are methyl.

21. A process for the manufacture of a compound of the formula [B] according to claim 19 or 20, wherein residue R₆ is hydrogen.

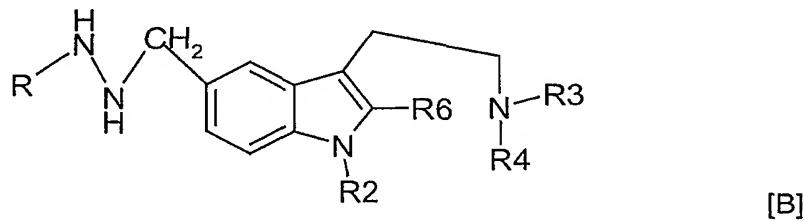
22. Process according to claim 21, where the compound of the formula [O], or a salt thereof, is obtained from a compound of the formula [G],



or a salt thereof, wherein each of R₂, R₃ and R₄ is as defined in any of claims 19 to 21 and L is halogen, by reacting it with first a lithium alkyl compound to form the lithio derivative and then with DMF or triethyl formate, to obtain a corresponding compound of the formula [O], or a salt thereof, after hydrolysis.

23. Process according to any of claims 19 to 22, wherein, prior to the reaction with the hydrazine, R₆ in the compound of the formula [O] if it is COOR₇, is converted into hydrogen, and the compound of the formula [O] is converted into an acid addition salt with a protic acid selected from hydrogen halide, sulphuric or sulphonic acid or a carboxylic acid, which is purified by crystallization or recrystallization.

24. A compound of the formula [B]



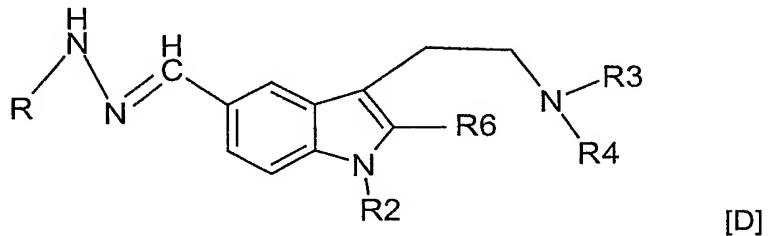
wherein

R is hydrogen or acyl

R₂ is hydrogen or a protecting group,

each of R3 and R4 is hydrogen or lower alkyl and
 R6 is hydrogen or a group COOR7, with R7 being hydrogen or one equivalent of a cation or a suitable hydrocarbon residue,
 or a salt thereof.

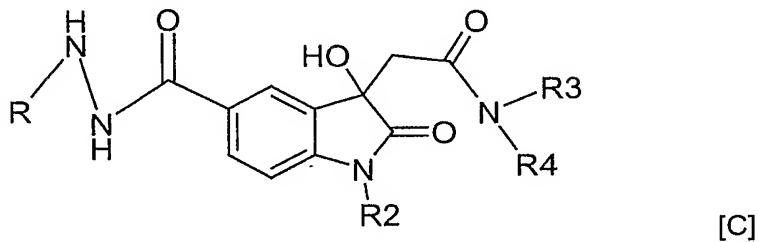
25. A compound of the formula [D]



wherein

R is hydrogen or acyl,
 R2 is hydrogen or a protecting group,
 each of R3 and R4 is hydrogen or lower alkyl, and
 R6 is hydrogen or COOR7, with R7 being hydrogen or one equivalent of a cation or a suitable hydrocarbon residue,
 or a salt thereof.

26. A compound of the formula [C]

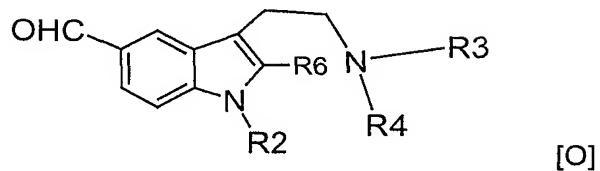


wherein

R is hydrogen,
 R2 is hydrogen or a protecting group,
 each of R3 and R4 is hydrogen or lower alkyl,
 or a salt thereof.

27. A compound of the formula [C] according to claim 26, wherein each of R3 and R4 is methyl.

28. Acid addition salt of a compound of formula [O]



wherein R2 is hydrogen or a protecting group, each of R3 and R4 is hydrogen or lower alkyl, R6 is hydrogen or COOR7, and R7 is hydrogen or one equivalent of a cation or a suitable hydrocarbon residue,

with a protic acid selected from hydrogen halide, sulphuric or sulphonic acid or a carboxylic acid.

29. Process for producing Rizatriptan or a salt thereof, wherein the process comprises the use of a compound of formula [B], [D], [E], [G], [H], [N] and/or [O] as defined in any of the preceding claims.